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EXAMINER	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 15

Application Number: 09/853,575
Filing Date: May 14, 2001
Appellant(s): WANG ET AL.

Stan Torgovitsky
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed December 13, 2002.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after second rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is deficient because, in lines 8-9 thereof, it is stated that the notch contains a luminescent material, when in fact the luminescent material may be placed inside or *outside* of the notch, as stated in lines 9-10 thereof. The summary of invention contained in the brief is otherwise correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that claims 1-5, 19, 20 and 43 do not stand or fall together but does not provide reasons in support thereof as set forth in 37 CFR § 1.192 (c)(7) and (c)(8). Therefore, claims 1-5, 19, 20 and 43 stand or fall together.

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

The following is a listing of the prior art of record relied upon in the rejection of claims under appeal.

5,659,643	APPELDORN et al.	08-1997
WO 95/27920	CROSSLAND et al.	10-1995

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-5, 19, 20 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crossland et al. (WO 95/27920) in view of Appeldorn et al. (US 5,659,643). This rejection is set forth in prior Office Action, Paper No. 9.

(11) Response to Argument

35 U.S.C. §103(a) Rejection of Claims 1-5, 19, 20 and 43.

I. Appellant states that Crossland et al. and Appeldorn et al., alone or in any reasonable combination, do not teach or suggest an optical luminescent display device, comprising both a luminescent material and an optical fiber as recited in independent claims 1, 3, 19 and 43 and do not teach or suggest a method for causing a luminescent material to emit visible light by emitting radiant energy into an optical fiber and directing the radiant energy toward a luminescent material via a notch formed in the optical fiber as recited in independent claim 20.

Appellant correctly states that Crossland et al. discloses a display screen comprising a backing layer **17** acting as a light guide. At the same time,

Appellant argues that Crossland et al. does not disclose, teach or suggest using anything other than the backing layer **17** as a light guide for the activating light.

Crossland et al. discloses a general layout of pixels in a display panel in Figure 1A. Figures 6-8 of Crossland et al. disclose light guide arrangements that may be employed in the display panel. The arrangements in Figures 6-8 of Crossland et al. comprise a backing layer **17** that is transparent to and guides light; a luminescent material **35**; a notch **85** formed in the backing layer **17** and adapted to direct a first type of radiant energy **88** within the backing layer **17** toward the luminescent material **35**; and a radiant energy source **86** emitting radiant energy into the backing layer **17**. The backing layer **17** disclosed by Crossland et al. is a planar light guide that operates on the principles of total internal reflection (see page 2, lines 23-27; page 5, lines 32-36; and page 12, lines 31-34). Crossland et al. discloses that the back plate or backing layer **17** must be transparent to the light that is used to activate the luminescent material **35**, however, Crossland et al. does not disclose, teach or suggest that a specific back plate or backing layer **17** must be used in the invention. Crossland et al. teaches that the backing layer **17** must be a transparent substrate that acts as a light guide, however, Crossland et al. does not teach that a specific transparent substrate must be used in the invention (see page 6, lines 20-21). Therefore, one of ordinary skill in the art would have recognized that any known light-guiding, transparent substrates could be incorporated in the invention of Crossland et al. as the backing layer **17**. And, since all light-guiding substrates,

regardless of the shape, operate on the same principles of total internal reflection, a person of ordinary skill in the art would have found it obvious to apply teachings directed toward one light guide to another light guide. Thus, one of ordinary skill in the art would have found it obvious to incorporate any known transparent, light-guiding substrate in the invention of Crossland et al. as the backing layer **17**.

Appeldorn et al. discloses an optical fiber **10** with a notch **12'** formed in the fiber **10** to cause the fiber **10** to emit light from a side in Figure 2. In Figures 4 and 6, Appeldorn et al. discloses side-emitting substrates that are each formed from an array of side-emitting optical fibers. The side-emitting substrates disclosed in Figures 4 and 6 of Appeldorn et al. are light guides that operate on the principals of total internal reflection. A person having ordinary skill in the art would have recognized the benefit of using any light-guiding, side-emitting, transparent substrate with a notch formed in the surface to direct light toward a luminescent material for a display device, as disclosed by Crossland et al., including light-guiding, side-emitting, transparent substrates formed from an array of optical fibers, as disclosed in Figures 4 and 6 of Appeldorn et al. Thus, one of ordinary skill in the art at the time of the invention would have found it obvious to incorporate a transparent substrate formed from an array of side-emitting optical fibers with notches therein, as disclosed in Figures 4 and 6 of Appeldorn et al., as the backing layer **17** in the invention of Crossland et al. to supply side-emitted light.

II. Appellant admits that Appeldorn et al. discloses using optical fibers that have notches as illumination devices. Appellant next argues that Appeldorn et al. does not disclose, teach or suggest using optical fibers as a light guide for the activating light for a phosphor-type light emitting element, but that Appeldorn discloses illumination devices wherein the optical fibers themselves serve as visible light emitting elements.

Appeldorn et al. is not relied upon for teaching directing activating light toward a phosphor-type light emitting (i.e. luminescent) element. Crossland et al. discloses directing activating light towards a phosphor-type light emitting (luminescent) element from a side-emitting backing layer **17**, wherein the backing layer **17** is an illumination device used to direct the activating light. Appeldorn et al. discloses illumination devices including a layer or array of side-emitting optical fibers in Figures 4 and 6, the fibers having notches for causing light to be emitted from the side thereof. One of ordinary skill in the art would have recognized that the layer or array of side-emitting optical fibers disclosed by Appeldorn et al. could be incorporated as the backing layer **17** in the invention of Crossland et al., as described in detail above, thus, one of ordinary skill in the art at the time of the invention would have found it obvious to incorporate the array of side-emitting optical fibers disclosed by Appeldorn et al. in the invention of Crossland et al. as the backing layer **17** to guide the activating light towards the luminescent material.

III. Appellant again asserts that Appeldorn et al. does not teach or suggest using optical fibers for delivering radiant energy to a luminescent material and does not teach or suggest directing radiant energy, emitted into an optical fiber, toward a luminescent material via a notch formed in the optical fibers.

Appeldorn et al., however, is only relied upon for teaching a side-emitting layer or array of optical fibers having notches to direct light. Crossland et al. teaches that radiant energy is directed toward a luminescent material via a notch in a light-guiding layer. The arrays of optical fibers disclosed in Figures 4 and 6 of Appeldorn et al. are light-guiding layers. As discussed in detail above, one of ordinary skill in the art at the time of the invention would have found it obvious to use the light-guiding array of optical fibers disclosed by Appeldorn et al. as the backing layer **17** of Crossland et al.

IV. Appellant correctly states that the Examiner concludes that one of ordinary skill in the art at the time of the invention would have found it obvious to incorporate an array of side-emitting optical fibers, as taught by Appeldorn et al., as the backing layer in the invention of Crossland et al. Appellant next argues that this is not supported by the actual disclosure of either Appeldorn or Crossland.

Crossland et al., however, does teach that backing layer **17** is a planar side-emitting light guide that operates on the principles of total internal reflection, and Appeldorn et al. does teach a planar side-emitting light guide formed from an array of optical fibers that also operates on the principles of total internal

reflection. Since, Crossland et al. does not disclose, teach, or suggest that a specific backing layer **17** be used in the invention, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a light-guiding layer disclosed by Appeldorn et al.

V. Appellant again asserts that nowhere does Crossland et al. teach or suggest having anything other than layer **17** as a light guide for providing activating light for "phosphor-type elements". Since this argument has already been shown to lack merit, no further comments by the examiner are deemed necessary.

VI. Appellant again asserts that Appeldorn et al. specifically teaches using the optical fibers themselves as illumination devices. Appellant states that the entire disclosure of Appeldorn et al. focuses on designing optical fibers as light fixtures and argues that Appeldorn et al. does not teach or suggest using optical fibers for providing activating light, but discloses that the light propagated through the optical fibers to be directly viewable. Appellant further asserts that Appeldorn et al. does not teach or suggest, but teaches away from, a device and a method wherein radiant energy is emitted into an optical fiber, and is then directed via the optical fiber to a luminescent material.

The backing layer **17** disclosed by Crossland et al. is an illumination device that provides light to the luminescent material **35**, for activating the luminescent material **35**. The illumination device disclosed by Appeldorn et al. is a layer of side-emitting optical fibers. As discussed in detail above, one of

ordinary skill in the art would have found it obvious to incorporate a layer of side-emitting optical fibers disclosed by Appeldorn et al. in the invention of Crossland et al. as the backing layer **17**, because both the backing layer of Crossland et al. and the fibers disclosed by Appeldorn et al. are directed to a common use in similar environments, i.e. they are both used as light guides based on the principles of total internal reflection and they both emit light from the side of the light guides via a notch or indentation, and, thus, there is an implied suggestion for applying the teachings of one to the other. Crossland et al. is relied upon for teaching that light is directed from the backing layer **17** toward a luminescent material **35** to activate the luminescent material. Thus, Appeldorn et al. is not relied upon for teaching that an activating light is directed toward a luminescent material.

VII. Appellant further states that the function and operation of optical fibers, particularly notched optical fibers which are capable of selectively emitting light only at notches thereof, is quite different form the light-diffusing panel which receives light from a source and provides a plane of light as implemented in Crossland et al., and that the Examiner's references to Figures 5 and 6 of Appeldorn et al. does not bolster the Examiner's position because having different cross-sections does not change the fact that these notched optical fibers do not diffuse light to provide a plane of light, but selectively emit light only at the notches. Appellant further argues that Appeldorn's disclosure of notched optical fibers having different cross-sections does not in any way suggest that such

notched optical fibers can somehow be used in place of a light-diffusing panel such as Crossland's backing layer and that without the benefit of Appellants' own disclosure, one of ordinary skill in the art would not have been motivated to replace Crossland's backing layer 17 with an array of optical fibers wherein each fiber is designed to provide selected illumination only at the notches thereof.

Examiner disagrees. On page 6, lines 3-5, Crossland et al. teaches that indentations or protuberances (i.e. notches) may be provided in the backing layer, forming *points* from which the radiation may be emitted. Therefore, Crossland et al. does teach that light is selectively emitted at points formed by the indentations or protuberances (i.e. notches) formed in the backing layer.

VIII. Appellant states that independent claim 43 defines an optical switch that also comprises an optical pickup arranged to optically communicate with the luminescent material. Appellant next argues that neither Crossland or Appeldorn discloses "an optical switch" let alone teach or suggest an optical switched as claimed in claim 43 and that the Examiner's assertion that one of ordinary skill in the art would have found it obvious to incorporate an optical pickup in the invention of Crossland et al. to receive the light from the luminescent material finds no basis in any of the prior art references.

In response to Applicant's arguments that claim 43 is novel because the claim discloses "an optical switch", the recitation "an optical switch" in line 1 of claim 43 has not been given patentable weight because it has been held that a preamble is denied the effect of a limitation where the claim is drawn to a

structure and the portion of the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951). In response to Applicant's argument that it would not have been obvious to incorporate an optical pickup in the invention of Crossland et al., Examiner disagrees. Optical pickups (i.e. receivers such as photodiodes) are commonly used to receive optical signals in optical systems. One of ordinary skill in the would have recognized that the light emitted by the display device disclosed by Crossland et al. could be received by any of numerous well known optical pick-ups for a variety of reasons, including analyzing and/or testing the light output from the display device of Crossland et al. Therefore, one of ordinary skill in the art would have found it obvious at the time of the invention to incorporate an optical pick-up in the invention of Crossland et al.

IX. Applicant further argues that Crossland et al. does not disclose any luminescent material, but simply provides directly viewable light.

Crossland et al., however, does disclose a luminescent material (phosphor-type elements 35, 37, 39 in Figure 7) that emits viewable light.

For the above reasons, it is believed that the rejections of claims 1-5, 19, 20 and 43 should be sustained.

Respectfully submitted,

MRCC
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